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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,939	08/31/2001	Min Seok Oh	P-0261	8961

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EXAMINER

LAMARRE, GUY J

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 05/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/942,939

Applicant(s)

OH, MIN SEOK

Examiner

Guy J. Lamarre

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/4/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/31/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

FINAL OFFICE ACTION

Response to Amendment

0. This office action is in response to Applicants' amendment of 2/4/05.
- 0.1 **Claim 4** is cancelled, **Claims 1-3** and **6-7** are amended, **Claims 8-17** are added. **Claims 1-3** and **5-17** remain pending.
- 0.2 The prior art claim rejections and objections of record are withdrawn in response to Applicants' amendment.

Response to Arguments

1. Applicants' arguments have been fully considered, and are deemed persuasive only to the extent that the amended approach, whereby 'binary equivalence matrix is of m times rows and columns of non-binary matrix and non-binary symbols have GF(2^m) dimension,' is not specifically disclosed in detail by prior art references of record. **Ramesh et al.** (US Patent No. 6,115,436) discloses such approach in Figs. 2-3, 7 at col. 2 lines 40-52 et seq.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

- 2.1 **Claims 1, 8-10** are rejected under 35 U.S.C. 101 as claiming a mathematical formula or algorithm. Applicant is advised to modify limitations of said claims as being incorporated or embedded in hardware or readable machine medium.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the **second** paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

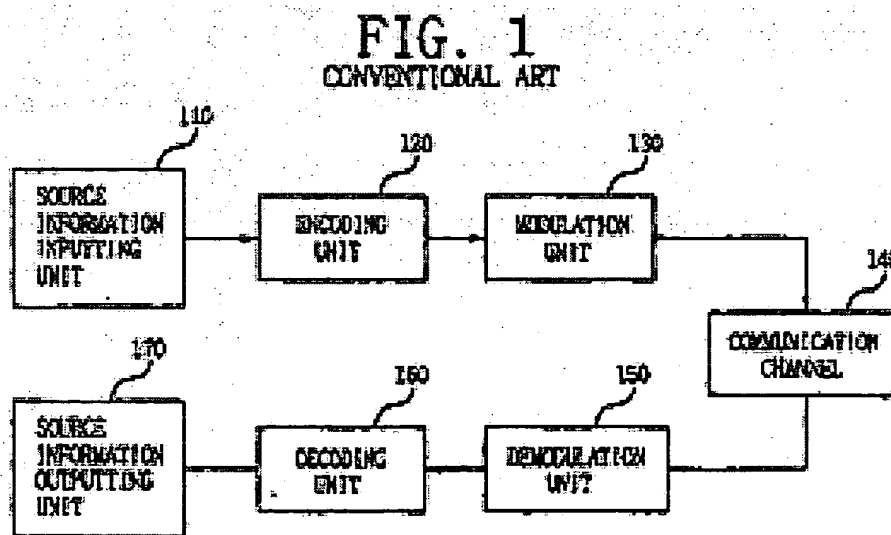
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3.1 Claims 1-3, 5-8, 9-10, 14-15 and intervening claims are rejected under the second paragraph of 35 U.S.C. 112 because it is unclear to the Examiner how rows and columns of the binary equivalent matrix are m times rows and columns of the non-binary matrix (e.g., claim 1) or how symbols have a $GF(2^m)$ dimension (e.g., claim 1), or how non-binary symbol is transformed into $m \times m$ matrix (e.g., claims 9, 14).

Claim Rejections - 35 USC ' 103

4. Claims 1-3, 5-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Applicants' Admitted prior art** (hereinafter **Admitted prior art**) in view of **Jedwab et al.** (US Patent No. 6,373,859; filed: 8 May 1998) in further view of **Ramesh et al.** (US Patent No. 6,115,436; filed 31 Dec. 1997).

As per **Claims 1-3, 5-17**, **Admitted prior art** substantially discloses the claimed RS coding conversion means, in **Admitted prior** Fig. 1, comprising: encoding/decoding/trellis processing/modulation/demodulation means as seen in **Admitted prior** Fig. 1, and means for



generating binary equivalence of the code by multiplying systematic generator matrix (Fig. 2 for matrix representation) and binary information sequence of the code; and generating row and column vectors (Fig. 2 for matrix representation) using the binary equivalence of the code as a component code. {See **Admitted prior art** Figs. 1-2, and related description.}

Not specifically described in detail in **Admitted prior art** is the step whereby the code is Reed-Solomon or non-binary.

However Jedwab et al., in an analogous art, discloses a generator matrix that converts plural non-binary sequences into binary sequences and vice versa for data processing. {See **Jedwab et al.**, Id., e.g., Fig. 13 and col. 72 line 1 et seq.}

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the procedure in the **Admitted prior art** by including therein data conversion means as taught by **Jedwab et al.**, because such modification would provide the procedure disclosed in **Admitted prior art** with a technique whereby *“data processing hardware is optimized for plural binary and non-binary data streams to thereby reduce communications system costs.”* {See **Jedwab et al.**, col. 72 line 45 et seq.}

While Admitted prior art and Jedwab et al. substantially disclose the procedure for the claimed method or apparatus, **they fail** to specifically mention that the approach whereby ‘binary equivalence matrix is of m times rows and columns of non-binary matrix and non-binary symbols have $GF(2^m)$ dimension.

However Ramesh et al., in an analogous art, discloses algorithms for **non-binary to binary signal conversion for RS coding** wherein such techniques are described. {See **Ramesh et al.**, Id., Abstract and Figs. 2-3, 7 at col. 2 lines 40-52 et seq.

In particular, Fig. 7, shown below, depicts reception of non-binary signal, transformation of such non-binary signal into a binary signal via a butterfly or $GF(2^m)$ operation for subsequent trellis processing:

For example, if $m=2$, 2 butterfly/binary operations will be performed for each non-binary signal received.

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Such transform can be represented as or is equivalent to the claimed approach whereby non-binary symbol matrix is of $GF(2^m)$ dimension. Refer to Figs. 2-5 and description thereof for further detail.

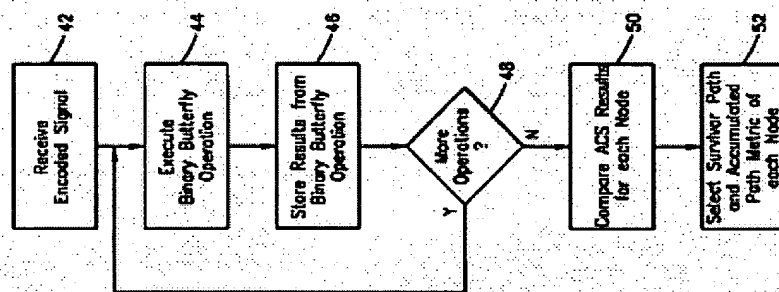


FIG. 7 }

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the procedure of the **Admitted prior art** and **Jedwab et al.** by including therein signal strength enhancement methods as taught by **Ramesh et al.**, because such modification would provide the procedure disclosed in the **Admitted prior art** and **Jedwab et al.** with a technique whereby data communications equipment is optimized via conversion of complex non-binary codes into much simpler binary structures, thereby resulting in substantial cost savings, coding circuitry reduction and faster data processing. {See **Ramesh et al.**, Id., at col. 7 lines 40- et seq.}

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks, Washington, D.C. 20231

or faxed to: (703) 872-9306 for all formal communications.

Hand-delivered responses should be brought to Customer Services, 220 20th Street S., Crystal Plaza II, Lobby, Room 1B03, Arlington, VA 22202.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guy J. Lamarre, P.E., whose telephone number is (571) 272-3826. The examiner can normally be reached on Monday to Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert De Cady, can be reached at (571) 272-3819.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-3609.

Information regarding the status of an application may also be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Guy J. Lamarre, P.E.
Primary Examiner
5/1/2005
